

# AMATEUR RADIO

FEBRUARY 1963

1st February, 1963

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## FEDERAL COMMENT

★

### OLD MAN N.F.D.

Every month in the year has some special significance to the Contest-minded Amateur. October is VK-ZL month, March is A.R.R.L. DX month, December-January is Ross Hull time, and February has now become Field Day month.

Yes, the month of February is here again and to an increasing number of enthusiasts, this means dusting off the mobile or portable rig, repairing the camping equipment and migrating to that favourite hill for a day or so to participate in the National Field Day Contest.

Despite the great interest and enthusiasm shown in England and U.S.A. for Field Day events, the Contest here has never enjoyed the same popularity. Yet today, more than ever before, this Contest needs that support. With the advent of the transistor, transmitters and power supplies and even receivers make it an easier proposition than it was, say 10 years ago.

If the Amateur is to increase his stature in the eyes of the public as has been so often propounded, he must be ready and able to operate under real emergency conditions. Here is a means of achieving some practice in this type of operation and at the same time getting away from the stuffy shack.

To misquote the words of a popular song: "Tote that gear, lift that mast, you get a little fun and you land a place (we hope) in the N.F.D." So good luck in this year's Contest, the last to be held under its present title. Let's make it a bumper wind-up to the N.F.D.

FEDERAL EXECUTIVE, W.I.A.

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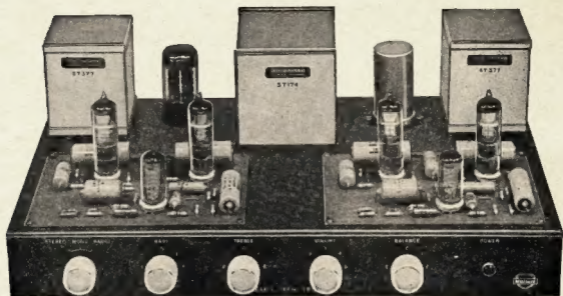
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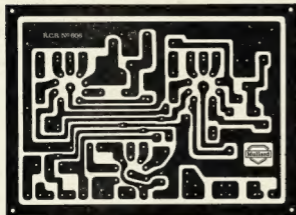


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# Surplus-Crystal High-Frequency Filters\*

BENJAMIN H. VESTER, W3TLN

**A**FTER all the recent "QST" articles on uses for high-frequency crystal filters, I've really been coveting one for a mobile s.s.b. transceiver I'm planning. The commercial price tags on filters being what they are, I decided it would have to be built from surplus crystals, or not at all. Having, during the earlier days of s.s.b., suffered with a low-frequency crystal filter (typical report was, "Gee, your voice sounds funny"), I decided to do a little reading before dragging out the soldering iron this time.

An article by Kosowsky† boils a lot of "long-hair" literature on crystal-lattice theory into a fairly simple and understandable form. One of the most interesting points to me was the fact that the crystal filter designer considers the narrow-band high-frequency crystal filter for s.s.b. to be the "easy" design—the problem getting much more exotic for the wide-band high-frequency filter. Since my buddy, W3HEC, was already tackling the tough problem of making a good low-frequency filter with the FT241 crystals, I took the easy way out and tried my hand with the high-frequency unit.

## SOME BACKGROUND

If you're planning to try your hand at it, it will help if you grab a few fundamental concepts on crystal lattice filters first. The properties of the crystal itself are pretty well known, the approximate equivalent circuit being shown in Fig. 1 and the change of reactance or impedance being shown in Fig. 2. The crystal has two resonances very close together, L and C being in series resonance at  $f_z$ , and L, C and  $C_0$  being parallel resonant at  $f_p$ . These resonance have been given names by the network theory boys, the series resonance being called a "zero" of impedance (for obvious reasons) and the parallel resonance being called a "pole" of impedance. The symbols used for these are shown in Fig. 2.



Fig. 1.—The equivalent circuit of a crystal. L and C are the electrical equivalents of mechanical parts of the crystal, while  $C_0$  is the shunting capacitance of the electrodes and holder.

These poles and zeroes are mighty convenient little symbols for handling networks, the most convenient part being the fact that if you have a circuit with several poles and zeroes, you can often manipulate the circuit values so as to get some of the zeroes each to cancel out a pole. Hence, a circuit with a multitude of resonances (or poles and zeroes) can be arranged to have

• Using the methods and circuits outlined here, the problem of making a usable high-frequency (i.e. in the 4 to 7 Mc. range) crystal filter doesn't sound too tough, even with limited test equipment. If you've been interested in some of the newer transmitting and receiving techniques using filters in this range, here's a way to give them a whirl without a large investment.

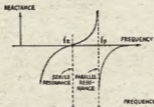


Fig. 2.—Reactance characteristics of a crystal. The series-resonant frequency,  $f_z$ , is that of L and C (Fig. 1) in series; the parallel-resonant frequency,  $f_p$ , is the resonant frequency of the parallel combination of L, C and  $C_0$  in one branch and  $C_0$  in the other.

its response equivalent to only a few resonances.

The universal crystal filter is a lattice circuit. The lattice is usually developed in full "four-arm" form (i.e. as a bridge circuit) and then the equivalence of the half-lattice is proved. The reader is referred to Kosowsky's article and its bibliography for the full treatment on this. We will settle for a few statements on crystal lattice filters which have been adequately proven by others.

Consider the simple one-section half lattice shown in Fig. 3. The first important point to consider is that the only way in which the lattice can give a high insertion loss between input and output is for the impedances of A and B to be about equal, so that the voltage at their common connection (point O) is equal to the voltage at the coil center tap. Our crystals will meet the requirement pretty well if they have the same holder capacitance, so the primary problem is to build the coil so that the

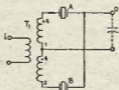


Fig. 3.—The half-lattice crystal filter. Crystals A and B should be chosen so that the parallel-resonant frequency of one is the same as the series-resonant frequency of the other. Very tight coupling between the two halves of the secondary of  $T_1$  is required for optimum results.

voltage from Terminals 1 to 2 is exactly the same as the voltage from 3 and 4. The method for realising this will be discussed a little later.

Crystals A and B are chosen to be different in frequency for the half lattice. Thus it is obvious that if we are at a zero (series resonant) frequency of, say, crystal A, the impedance balance of A and B is spoiled and there is a voltage showing up between point O and the centre of the coil. This will also occur at the pole (parallel resonant) frequency of crystal A. The same can be said for crystal B, only the unbalance is in the opposite direction. This leads us directly into the statement that the pass band of the crystal filter will be as wide as the spacing of all the poles and zeroes. This says nothing about the ripple or variation in transmission in the pass band, however, and if A and B are far apart the ripple or dip may be tremendous. Here's where the network theory boys' trick of pairing off poles and zeroes comes in handy. A little study with Fig. 2 of the way in which the impedance change around a zero differs from that around a pole will give an idea how the lattice crystals can be arranged to give a flat pass band. Fig. 4 shows the desired arrangement. The series-resonant frequency of crystal B is arranged to coincide with the parallel resonant frequency of crystal A. This will theoretically give a perfectly flat pass band from the zero of crystal A to the pole of crystal B.

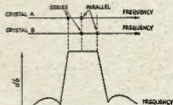


Fig. 4.—The theoretical attenuation-v.-frequency curve of a half-lattice filter shows a flat pass band between the lower series-resonant frequency and higher parallel-resonant frequency of the pair of crystals.

Our problem is now resolved down to determining the pole-zero spacing for the available crystals. The surplus FT243 crystals in the 5 Mc. range (this choice of frequency was obviously based on the excellent results being obtained with the popular HT32 transmitter) have a measured spacing of about 2.2 Kc. between their series and parallel-resonant frequencies. Thus, two of them spaced 2.2 Kc. apart in frequency are theoretically capable of giving a 4.4 Kc. bandwidth. Practically, it is very difficult to get quite this much bandwidth.

If we examine the effects that the external coupling circuitry has on the pole-zero spacing, it can be shown that both an increase and a decrease in the

\* Reprinted from "QST," January, 1959.

† Kosowsky, "High Frequency Crystal Filter Design Techniques and Applications," Proceedings of the I.R.E., Feb., 1958.

spacing can be accomplished, by shunting inductance or capacitance, respectively, across the crystal. The most familiar example of this to most of us is in pulling a crystal oscillator's frequency by shunting a capacitor across the crystal. This technique, you will remember, only works where the crystal is being used in its parallel-resonant mode.

Referring back to Fig. 1, it is easily seen that a parallel capacitor makes Co larger and lowers the parallel-resonant frequency (pole). It will not affect the series-resonant frequency (zero), so the effect of the parallel capacitor is to move the pole closer to the zero. Similarly, it can be shown that an inductance shunted around the crystal will push the pole away from

frequency difference; best accuracy is obtained by measuring the harmonics of the generator with the receiver in the sharp crystal-filter position.<sup>†</sup>

Initial measurements of the two 5645 Kc. crystals I had showed a pole-to-zero spacing of 2.2 Kc. on one and 2.4 Kc. on the other. Their series-resonant frequencies were about 560 cycles apart. I decided to try these out first to get a bearing on the problem.

As indicated earlier, the push-pull coil must have very tight coupling between its two secondaries and should be chosen with a high enough inductance to avoid resonance with the crystal shunt capacitance near the pass band. I used a  $\frac{1}{2}$ " ferrite toroid (origin and properties unknown) with the secondaries wound bifilar. The bifilar winding

put signal into a range which was covered by my receiver (a 75A-3) so the receiver could be used for both db. and frequency measurements. The initial response was as shown by curve "A" in Fig. 7. A 10K resistor was then added to terminate the filter and the response squared up (as shown by curve "B") to give a passable 1 Kc. high-frequency filter.

This was sufficiently encouraging, so I dug out the ammonium bichloride etching bath from its hiding place and moved the upper-frequency crystal to a frequency 1,500 cycles above the lower frequency (W21HW's technique for etching crystals is really simple).

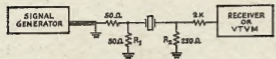


Fig. 5—Set-up for measuring the series and parallel-resonant frequencies (or pole-zero spacing) of a crystal.

the zero; unfortunately, however, this also introduces a second parallel-resonant frequency. Even the network theory boys begin to sweat a little when they begin to manipulate this many poles and zeroes in a lattice circuit, so we Hams had better avoid the complications, and shy away from trying to add tuned inductors on the input and output of the filter. If we are forced to use an inductor, we will make its inductance large enough to avoid its resonating with Co anywhere near the desired pass band.

## PRELIMINARY MEASUREMENTS

Now that we have some ideas as to how crystal filters work, we will get more specific and look at the procedure by which one may be evolved. To measure the spacing between the series and parallel-resonant frequencies, we must be careful to avoid having the test circuit put shunt capacitance across the crystal and give erroneous results. The circuit in Fig. 5 was used by the writer.

To eliminate the extra shunt capacitance that a socket would add, the crystal holders were soldered directly into the circuit. The signal generator can be most any kind, so long as it has a slow tuning rate—I used one of the Command transmitters. The measurement detector can be a scope, a v.t.v.m. (with r.f. probe), or the station receiver. The low resistance R2 across it should swamp out any small amount of input capacitance it might have. If a receiver is used, a 1K or 2K resistor should probably be put in series with its input to isolate the crystal from the receiver front-end tuned circuits. The series and parallel-resonant frequencies are, of course, at the peak and null of the signal across R2. Any decent communications receiver will measure the

is illustrated in Fig. 6. The enclosed L5 series coils made by C.T.C. probably would work just as well. (It would probably be very difficult to get tight enough coupling with air-wound coils, however.) I arbitrarily made each half of the secondary coil with an inductance of 50 microhenrys; this required 25 bifilar turns, or 50 turns total. The exact inductance is not at all crucial—the important thing is the tight coupling.

## EXPERIMENTAL RESULTS

A filter was constructed with the circuit shown in Fig. 3. It was fed from a low impedance source, and its output was fed into a 6AK5 mixer grid, the mixer grid effectively shunting some capacitance across the crystals. This mixer was used to beat the filter out-

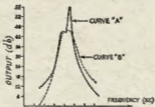


Fig. 7—Measured attenuation curves of a half-lattice filter using two nominal 5645 Kc. crystals having series-resonant frequencies separated by 560 cycles. A—without resistance termination; B—with 10,000 ohm terminating resistor. In taking the data for these curves and those shown in Figs. 8, 9, and 11, the attenuation was based on the manufacturer's calibration of the receiver used in the tests.

i.e., after adjusting the generator to the series-resonant frequency, let the generator alone and shift the receiver to some higher range where a generator harmonic can be heard and its frequency measured. Then shift back to the fundamental frequency, adjust the generator to the parallel-resonant frequency, shift the receiver again and then measure the generator harmonic adjacent to the first one. The frequency separation between the crystals is of course equal to the frequency difference between the harmonics divided by the order of the harmonic. This method usually will give improved accuracy only if the receiver calibration can be read to the same accuracy—e.g., 1 Kc. per dial division on the harmonic range as on the fundamental.—Editor.

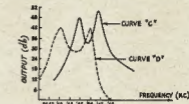


Fig. 8—Attenuation curves of half-lattice filter with crystals of the same nominal frequency as in Fig. 7, but with 2.5 Kc. separation. C—with 0.5 megohm terminating resistor; D—shunt coil added across the output to resonate with capacitance present at that point.

The initial results with this were anything but encouraging. Curve "C" in Fig. 8 illustrates the results. It was obvious that the capacitance across the lattice output had shoved the poles too close to the zeroes, or else the 0.5 meg. terminating resistor was improper. I tried tuning the capacitance out with a slug-tuned coil and got all kinds of interesting results (curve "D" in Fig. 8 is typical), none of them usable. When I terminated the filter with lower values of resistance, however, the results improved markedly. With just the right resistor, 1.5K in this case, the pass band was flat over a reasonable width. Curve "E" in Fig. 9 shows the final results. The bandwidth is just barely great enough for phone use.

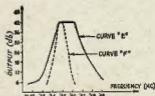


Fig. 9—E-half-lattice filter using same crystals as in Fig. 8, but with 1,500 ohm terminating resistor. F—using two nominal 5645 Kc. crystals separated 300 cycles, with 1,500 ohm terminating resistor.

Since I had one other 5645 Kc. crystal which was 300 cycles from one of the original crystals, I substituted it in and got curve "F" in Fig. 9. This time a 3.9 K terminating resistor gave the flattest pass band.

If greater rejection off the skirts is required, there are several ways in which these sections can be cascaded. Crystals of the same frequency can be paralleled on the half-lattice arms, or an isolating tube can be placed between



Fig. 6—Bifilar winding on a toroidal core.

<sup>†</sup> Newland, "A Safe Method for Etching Crystals," "QST," January 1958.

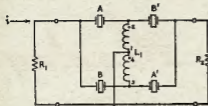


Fig. 10.—Half-lattice filters cascaded in a back-to-back arrangement. The theoretical curve of such a filter has increased skirt selectivity and fewer spurious responses, as compared with a simple half lattice, but the same pass band as the simple circuit.

two sections. A simpler technique is to connect them back to back as shown in Fig. 10. This method of connection will minimise spurious off-frequency response since the probability of getting the spurious responses of crystals A and B to line up with those of crystals A1 and B1 is pretty small. The coil, L1, is again wound bifilar and R1 and R2 are chosen experimentally for the best pass band. The crystals should be matched as closely as you can read their frequency—this is pretty easy with the etching technique.

Fig. 11 shows the response I got from four 7300 Kc. crystals, connected like Fig. 10 (crystals A and A1 were 1.5 Kc. higher than B and B1). The same bifilar coil was used. Incidentally, I got a peep inside one of the 9 Mc. commercial s.s.b. filters recently and they used this circuit. Their filter used an LS-8 coil (C.T.C. Corp.) for L1.

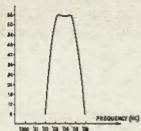


Fig. 11.—Attenuation curve of filter using four nominal 7300 Kc. crystals, pairs separated 1.5 Kc. in the circuit of Fig. 10.

I measured the spacing between series and parallel resonance of a few of the other surplus crystals that were lying around and got the following results:

Crystal Freq.	Type	Pole-Zero Spacing
8725 Kc.	FT243	2.7 Kc.
7250 Kc.	FT243	2.3 Kc.
7380 Kc.	Plated-surplus	5 Kc.
7010 Kc.	Plated-surplus	6 Kc.
8900 Kc.	Plated-harmonic cut	20 Kc.

Obviously, the plated crystals will give wider-band filters.

If you're interested in an asymmetrical filter which has a gradual fall-off on one side, then the circuit shown in Fig. 12 can be used. Here both the crystals are on exactly the same frequency. The coils are again bifilar and C is tuned to give the desired pass band. The potential bandwidth here is only half that obtained with the half-lattice. It should work nicely with the plated crystals, however.

I hope this will encourage some of you fellows to try your hand at build-

ing filters. I only have a handful of crystals and have only spent a couple of weeks playing with them, so I have not had an opportunity to try all the circuits.

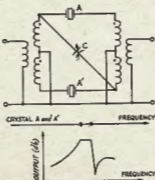


Fig. 12.—An asymmetrical filter and theoretical attenuation curve.

## TECHNICAL ARTICLES

Readers are requested to submit articles for publication in "A.R.," in particular constructional articles, photographs of stations and gear, together with articles suitable for beginners, are required.



Manuscripts should preferably be typewritten but if handwritten please double space the writing. Drawings will be done by "A.R." staff provided that the article is illustrated.



Photographs will be returned if the sender's name and address is shown on the back of each photograph submitted.



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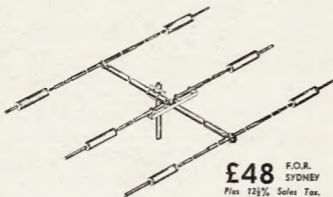
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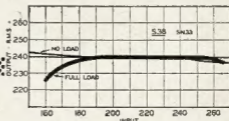


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# A Combination S.W.R. Bridge and Amplifier Linearity Indicator\*

H. C. SHERROD, W5ZG

AN s.w.r. indicator/relative power output indicator is a useful device which is popular because of its simplicity and economy. The usual unit consists of an r.f. sampling device connected in the transmission line and a high resistance d.c. voltmeter. The sampled voltages are rectified to reveal the forward and reflected powers in the line. From this information we can determine the standing wave ratio in the usual manner and the relative power output is indicated by the forward reading.

## THE LINEARITY MEASUREMENT

It is important to realize that the forward rectified voltage varies directly with the forward r.f. power in the line. With this thought in mind, consider a linear r.f. amplifier.

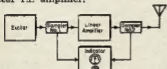


Fig. 1.—Block diagram of the linearity metering setup. Two identical r.f. sampling devices are used with their outputs fed into a comparison circuit. The adjusting potentiometer is calibrated in db. and indicates the gain of the linear.

Within the limits of linearity, the ratio of output power to input power is constant. If identical r.f. sampling devices are inserted in the input and output coaxial lines of such an amplifier, as shown in Fig. 1, the ratio of the forward rectified voltages from the two sampling units will be constant within the limits of linearity of the amplifier. By using a zero-centre scale voltmeter and a comparison circuit with a

● The author presents a unique but simple device for use with a linear r.f. amplifier that indicates relative input and output power, input and output s.w.r., and amplifier linearity deviation.

potentiometer for equalizing the ratio of the forward rectified voltages from the sampling devices, a visual indication of the linearity deviation can be obtained. The indication is derived from true dynamic conditions. Since the adjustment of the equalising potentiometer is a function of the power gain of the amplifier, this potentiometer can be calibrated in terms of db. gain or other acceptable units.

Data for the calibration of the potentiometer in db. is given in Table 1 and the derivation of Table 1 is explained at the end of this article. This potentiometer can be calibrated with a reliable ohmmeter.

Gain, db.	X, Ohms	Y, Ohms
0	10,000	0
2	8,854	1,146
4	7,738	2,262
6	6,677	3,323
8	5,693	4,305
10	4,805	5,195
12	4,015	5,985
14	3,326	6,674
16	2,736	7,264
18	2,236	7,764
20	1,818	8,182

Table 1.—Calibration data for the Linearity Balance potentiometer. Areas X and Y of this potentiometer are identified in Fig. 2.

As explained, two r.f. sampling devices and a zero-centre meter are required to indicate linearity deviation. By incorporating a switch, an additional potentiometer and a few resistors, the meter and sampling devices can be connected to indicate the functions listed below:—

- Amplifier Input—Relative Forward Power.
- Amplifier Input—Reflected Power—S.W.R.
- Linearity Deviation.
- Amplifier Output—Reflected Power—S.W.R.
- Amplifier Output—Relative Forward Power.

## CONSTRUCTION

The circuit of the complete unit is shown in Fig. 2. The operation of the two s.w.r. bridges is conventional and is described in the handbooks. The instrument housing should be large enough to contain the two potentiometers, the five-section switch and the four 10K, 1 watt, resistors. The four phone jack type connectors are located on the rear of the cabinet. Wiring is not particularly critical.

Construction data for the line samplers is shown in Fig. 3. The units are made from 1" aluminium angle stock. The main conductor, 3/16" o.d. copper tubing, is connected to the two hot lugs of the coax connectors (in this case type C) and if the measurements are followed exactly, they will be 3-7/8", centre to centre.

The 1" thick polystyrene blocks support the two 12 gauge copper wire sampling lines.

Fig. 4 shows a suggested panel arrangement of the unit and a tabulation of meter readings against the standing wave ratio. A photograph of the unit is not shown since it is an integral part of the author's lkw. linear amplifier and would show very little if any detail.

## OPERATION

Application of this unit is explained for each function.

**Input S.W.R.**—Throw the selector switch to the **input forward** position. Apply carrier excitation to the amplifier and adjust the s.w.r. sensitivity control for full scale deflection of the meter. Throw selector switch to **input reflected** position and adjust grid circuit tuning of the r.f. amplifier for minimum meter reading.

**Output S.W.R.**—Throw the selector switch to **output forward** position and, with carrier, adjust s.w.r. sensitivity control for full scale deflection of meter. Throw selector switch to **output reflected** position and read standing wave ratio of amplifier load.

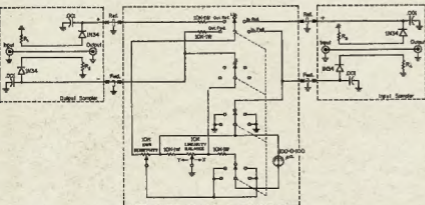


Fig. 2.—Circuit of the S.W.R. Bridge/Linearity Indicator. The value of resistors R1 to R4 is determined by the coaxial cable impedance. For 52 ohms 175 ohms 1 watt carbon resistors are used. For 72 ohm coax, the value should be approximately 240 ohms.

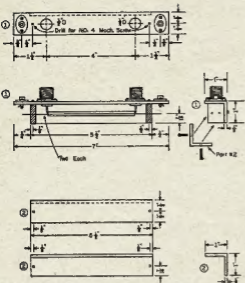


Fig. 3—Construction data for the two identical linear amplifiers. The stock is  $\frac{1}{8} \times 1$  inch aluminium angle.

**Linearity.**—With full carrier inserted, and the amplifier operating under full load, throw selector switch to **Linearity** position and adjust the linearity balance potentiometer for zero meter reading. Remove full carrier excitation and place amplifier in normal operating condition. If the amplifier is linear, the indicating meter will not deviate from zero during amplifier operation. When the linearity balance potentiometer is adjusted as described, the potentiometer setting indicates the db. gain of the amplifier.

As indicated previously, in linear operation there should be no shift in the meter indication at all. In the absence of linear operation the deviation shown by the meter would vary with the amount of excitation. This shift could be caused by improper grid bias, parasitics, improper plate and/or screen voltage, improper amplifier loading or by any combination of these conditions. The operator should be concerned about any meter deflection of more than five microamperes and

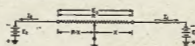
should in reality only settle for operation with no meter shift at all.

As a zero centre scale meter was required to indicate deviation from linearity, the diode rectifiers in the two r.f. sampling devices were connected to provide d.c. voltages of opposite polarity. With this arrangement, forward power is indicated by a deflection of the meter in one direction. Reflected power is indicated by a deflection of the meter in the opposite direction.

#### ADDENDUM

While it is not necessary for the construction of the unit, some readers may desire an understanding of the computations involved in determining the resistance points necessary to calibrate the linearity balance potentiometer in terms of db. of amplifier gain. The explanation is divided into two parts; first a purely theoretical analysis and secondly, the practical application.

#### Theoretical Analysis



$R$  = Total potentiometer resistance in ohms.

$X$  = Resistance of portion of pot. to right of arm, in ohms.

$R-X$  = Resistance of portion of pot. to left of arm, in ohms.

$E_2$  = Voltage across portion of pot. to right of arm.

$E_1$  = Voltage across portion of pot. to left of arm.

$E_0$  = Total voltage across pot.

$I_1$  = Current through  $X$  portion of pot.

$I_2$  = Current through  $R-X$  portion of pot.

From the above then:

$$E_1 = I_1 X$$

$$E_2 = I_2 (R - X)$$

$$\text{when } E_1 = E_2 \quad I_1 X = I_2 (R - X)$$

$$\text{and } \frac{I_1}{I_2} = \frac{R - X}{X}$$

The ratio of voltages  $E_1$  and  $E_2$  can be expressed:

$$\text{db.} = 20 \log \left( \frac{E_1}{E_2} \right)$$

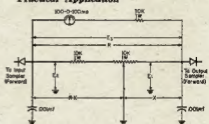
Similarly, the ratio of currents  $I_1$  and  $I_2$  can be expressed:

$$\text{db.} = 20 \log \left( \frac{I_1}{I_2} \right)$$

$$\text{Substituting: db.} = 20 \log \left( \frac{R - X}{X} \right)$$

Note that, when db. = 0,  $R - X = X$ . Also, when the pot. is adjusted so that  $E_1 = 0$ , the pot. setting ( $(R - X) \div X$ ) can be calibrated in db.

#### Practical Application



From the theoretical analysis it may be seen that, when  $E_1 = E_2$ ,  $E_0 = 0$  and

$$\text{db.} = 20 \log \left( \frac{R - X}{X} \right)$$

the following chart (Table 2) may be derived as was given in abbreviated form in Table 1.

Gain db.	$R-X$ Ohms	$X$ Ohms	$\frac{R-X}{X}$	$\log \left( \frac{R-X}{X} \right)$
0	10,000	10,000	1.0000	0.0000
2	11,146	8,854	1.2589	0.1000
4	12,589	7,738	1.5849	0.2000
6	14,323	6,877	1.9953	0.3000
8	16,305	5,895	2.5117	0.4000
10	18,519	4,905	3.1623	0.5000
12	21,005	4,015	3.9810	0.6000
14	23,774	3,238	5.0122	0.7000
16	26,864	2,738	6.3100	0.8000
18	29,784	2,238	7.9433	0.9000
20	32,682	1,818	10.0000	1.0000

Table 2.

#### W.I.A. 50 Mc. W.A.S.

Call	Cer. Add. No. Cntr.	Call	Cer. Add. No. Cntr.
VK4HD	27 8	VKBQ	23 3
VK4AZ	26 7	VKTLZ	24 3
VK4BZ	25 6	VKXZ	25 3
VK2WJ	13 4	VKSAU	22 3
VK3ZFM	32 4	VK3GZ	28 2
VK3H	30 4	VK3ZT	31 2
VK4PU	23 3	VK2AZ	32 2
VK4H	4 2	VK3ZMK	38 2
VK3PG	5 2	VK2AZA	34 1
VK2AB	9 2	VK3Z	37 1
VK2V	9 2	VK3AX	36 -
VK3GG	18 3		

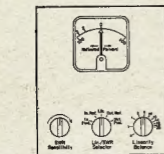


Fig. 4—Suggested panel arrangement. The s.w.r. calibration marks shown correspond as follows: An s.w.r. of 1:1 equals 0  $\mu$ A., 2:1 equals 63.5  $\mu$ A., 3:1 equals 88.6  $\mu$ A. on the meter scale.

# HIGH FREQUENCY CRYSTAL FILTERS

ARIE BLES, VK2AVA

**C**RYSTAL filters on frequencies between 5 and 9 Mc. are now being used in many commercial Amateur transmitters and transceivers. The McCoy crystal filter on 9 Mc. can be bought as a separate unit and provides an excellent basis for a simple s.s.b. rig, but the \$32.50 U.S.A. price may be a lot higher before it is in your shack.

Some Amateurs have tried filters with FT243 surplus crystals with limited success, regardless of the claims made in articles in "QST," of January 1959, May 1960, and October 1960. The filter bandpass curves published in these articles are difficult to duplicate, at least I have never had success myself.

The advantages of a high frequency filter are obvious. One can save at least one stage or sometimes two stages of frequency conversion. Consequently there are less oscillators producing unwanted spurious frequencies and less risk of frequency conversion and mixing distortion and unwanted by-products. In particular for the v.h.f. bands, a s.s.b. transmitter starting with a 450 Kc. sideband generator will become quite involved.

My earlier experiments were made with a limited supply of 5,000 Kc. crystals. A lot of work is required to not only check their zero and anti-resonance frequencies, but some have to be changed in frequency to obtain matched pairs and invariably one will overshoot the desired frequency and loose crystals. Recently I have had the luck to play with several hundreds of crystals of the same frequencies and that offered a much better chance to arrive at something.

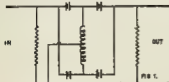


Fig. 1.

As explained in the "QST" articles referred to, the recommended circuit is not a standard half-lattice set-up but a hybrid circuit, using four crystals, two pairs of two crystals closely matched in frequency and 2,000 cycles in frequency apart. This is being done to make the second higher frequency pair of crystals to fall on the so-called pole-frequency of the first lower frequency pair of crystals.

All crystals, when used as filters, will demonstrate two distinct resonance points, one, the lower frequency one, where the r.f. resistance of the crystal is lowest, its zero resonance point, and a second frequency, higher than the zero resonance point, where the resistance is largest, its parallel or pole frequency point. If the zero frequen-

cies of the second pair match the pole frequencies of the first pair, it is supposed to provide a flat bandpass curve.

The centre tapped tuned circuit (as in Fig. 1) between the four crystals has always given me trouble. Some sources say tight coupling is a necessity, so use a bi-flar wound coil. Others say, no, tune the circuit to resonance and use a standard good quality coil and that will do the trick. Others again say a high quality toroid coil core is a necessity, a.s.o. But all have had trouble to flatten the peaks and valleys in the bandpass. They use rather low resistors at both ends of the filter to swamp the circuit and are obviously trying to smooth out the bandpass curve.

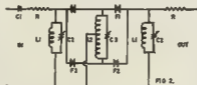


Fig. 2.

- C1-0.002  $\mu$ F.
- C2-50 pF.
- C3-0.002  $\mu$ F. Philips trimmer, about half capacity.
- L1-Iron slug tuned coil, approx. resonating on 5.5 Mc.
- L2-17 turns bi-flar wound litz wire on Command Set iron core (36 turns).
- P1-P1 plus 1,500 to 2,000 cycles.
- R2-5,000 ohms.

I have never been able to lay my hands on a genuine toroid coil core, so at last tried my luck with a powdered iron core out of the final tank coil of a Command transmitter. It is about 2" in diameter and 1" long, and the small hole in the centre can be enlarged with an ordinary drill. Seventeen turns of bi-flar wound litz wire and a Philips pot trimmer gave better results than anything I had tried before, but still that blasted trouble to smoothen the humps in the bandpass curve.

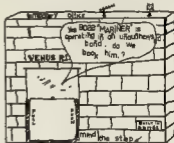
Well, to cut a long story short, instead of swamping the filter with resistors I have loaded it with tuned circuits and inserted series resistance in the input and output of the filter. In this manner I could immediately improve the bandpass curve, get an almost perfect flat bandpass with nice steep sides, obtain a good shape factor, and flatten out slight irregularities in the curve with small adjustments of the three tuned circuits in the filter. The procedure is to tune for maximum response on the frequency half way between those of the crystals and next make slight adjustments, one way or the other, of the tuned circuits, no more.

Do not ask me why this arrangement works in preference over and better than what others have used. The main thing is it works well without much trouble of alignment. The series

resistances involve some loss of signal but probably much less than parallel resistance swamping; the impedance of this circuit is of course much higher I shall not apply for a patent on the circuit—yet.

Considering the work involved to select suitable crystals and the fairly large number required to obtain useable pairs that will match, I am going to offer help again to those who want it, like in the case of the 80 odd sets of 400 Kc. crystals that have found their destination.

I have been allowed access to large numbers of crystals, FT243 surplus types, procured by the N.S.W. section of the W.I.A., and am already checking, matching and testing them in this circuit of mine. A set of four crystals, matched in frequency and response, plus two carrier oscillator crystals, selected and etched to fall on the 20 db. down points of the bandpass curve of the particular set of four crystals, on 5436 Kc., or after exhausting the supply of those crystals, elsewhere between 5 and 6 Mc., will be available to genuinely interested Amateurs on direct application to me for three guineas, post paid.



## NAT. FIELD DAY 1963

The National Field Day Contest will be held on Saturday, 9th February, and Sunday, 10th February. The rules appeared on page 17 of the last issue.

### ADDITIONAL RULE 6A

Entrants to Section C for Multiple Operator Stations can set up separate transmitters to work on different bands at the same time. All such units of a Multiple Operator Station must be located within an area that can be encompassed by a circle not greater than half a mile diameter.

For each transmitter of a Multiple Operator Station a separate log shall be kept with serial numbers starting from 001 and increasing by one for each successive contact. All logs of a Multiple Operator Station shall be submitted by the Operator under whose Call Sign the transmitters are working. No two transmitters of a Multiple Operator Station are permitted to operate on the same band at any time.

†A recommended type is the Mullard FK1206.  
—Editor.



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 spring tension. It is removed by press-  
 ing a button.

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12 Volt Working:	2 and 5 µF.	2/-
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	10 µF.	2/5
	50 µF.	3/3

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## WARBURTON FRANKI

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# MORE ABOUT FT241 SURPLUS CRYSTALS

ARIE BLES, VK2AVA

**M**ILLIONS of these crystals must have been made during the last war as they are still plentiful—unfortunately not in this country. They were made for the SCR508 I.M. transceivers that operated from tanks on frequencies between 20.0 and 38.9 Mc. at 0.1 Mc. intervals. The crystals are marked with these frequencies but their basic frequencies are actually between 370 and 540 Kc. In the tank sets where they were used, the modulation was applied to the crystal oscillator and the resultant phase modulated signal was multiplied 54 or 72 times, depending upon the use of the crystal and the series in which it belongs.

There are two groups of crystals (see Tables next page):—

- (a) Those in **black holders**, marked 20.0 to 38.9 Mc. with channel numbers 0 to 79; crystal frequencies 370.370 to 516.667 Kc. (never exact) in steps of 1,851 cycles apart.
- (b) Those in **brown holders**, marked 27.0 to 38.9 Mc. with channel numbers 270 to 389; crystal frequencies 375.000 to 540.277 Kc. (may be as much as 250 to 300 cycles off) in steps of 1,389 cycles apart.

Because those crystals had to be used in tanks, they are ruggedly built, but still they may be defective now. The crystals are only about  $\frac{1}{8}$ " to  $\frac{1}{4}$ " square, as thin as a normal 7 Mc. crystal, they vibrate transversally, and their size determines their frequency.

They were originally silver or gold plated, small thin wires soldered in the centre of the crystal-electrodes faces, and these small  $\frac{1}{8}$ " wires soldered on to springy sort of suspension wires that are attached to pins spaced  $\frac{1}{8}$ " apart.

\* 33 Plateau Road, Springwood, N.S.W.

● The author's recent contribution to Bud Pounsett's s.a.b. column has raised the interest in those very useful FT241A crystals and here is a set of details regarding them.

I cannot express it in g's acceleration, but know from experience that a good crystal will easily survive a drop on to a concrete floor from a height of four feet (not recommended as a test!).

On the average these crystals are good and vigorous oscillators, but there are bad ones amongst them—discounting the ones where the little wires on the crystal-electrodes faces have come loose (this is mainly due to corrosion of the electrodes and consequent loss of crystal activity). Remedies, however, both for loose contact wires and corroded electrodes are possible.

When one of the little wires has come loose, do not throw away your crystal. If you check the small dot of solder on the crystal electrode, using a magnifying glass or loupe, you will frequently see a little hole in it where the wire has been in before it came loose. Carefully bring the wire back in position, bend one of the spring-wires a little to create some pressure to the crystal and hold the contact wire in place and your crystal very likely will be OK again.

Loss of activity due to corroded electrodes is very common with crystals that were improperly stored, as many must have been. The remedy is to re-silverplate the crystal. There apparently is always enough material left to conduct for plating and you can obtain a crystal that will be active on a lower frequency like a new crystal. For the

plating, one could also use a copper-sulphate solution, but it is inferior to silverplating with a silvernitrate solution. Many formulae exist for silverplating, none work as well as a special cyanate professional plating solution that is rather poisonous and must be handled with care.

The frequencies of the crystals can be shifted up and down with extreme care sometimes, but it is possible. To lower the frequency up to over 2,000 cycles, one can weight the electrodes either by silverplating or, for a limited shift, by simply rubbing some carbon on to them with a soft pencil. For that operation, hold the crystal steady between two fingers and watch where the pencil tip goes. If you touch the contact wires too often, they may come loose. Silverplating should be done with not more than 1 mA. plating current. A  $1\frac{1}{2}$  volt cell and a 1,000 ohm resistor in series are safe. The crystal should be on the negative side of the battery.

To raise the frequency of the crystal is more difficult. Never try to take off some of the material of the electrodes by reversing the plating procedure. There is never much thickness in the electrodes and you risk that all of a sudden you have a nice clean transparent crystal left! The only way to raise the frequency is by edge-grinding the crystal. Some sources have recommended to unsolder the contact wires and then to hold the crystal in your fingers while edge-grinding. Personally, I prefer to use a pair of small tweezers to hold the sides of the crystal with the bottom part of the crystal-holder still attached and lying flat on the table and gently move a thin grinding stone along one edge of the crystal. I have managed to raise the frequency that way 20 and more Kc.,

## CRYSTALS for Lattice Filters and S.S.B. Equipment

FT-241 Crystals in MATCHED PAIRS  $\pm 5$  CYCLES are available in following frequencies:

444.444 Kc.	451.852 Kc.	459.259 Kc.	464.815 Kc.
446.296 Kc.	453.704 Kc.	461.111 Kc.	466.607 Kc.
448.148 Kc.	455.407 Kc.	462.963 Kc.	468.519 Kc.
450.000 Kc.			470.370 Kc.

Price per MATCHED PAIR  
£3/12/6

Includes sales tax and one dual crystal socket.

455.000 Kc. Crystals, £2/0/0 each, includes sales tax and crystal socket.

HC6/U 100 Kc. Marker Crystals, £4/16/0 each, includes sales tax and crystal socket.

FX-1 Type Crystals, 0.001% accuracy: 1,000 Kc., £5/15/6; 3,500 Kc., £4/6/6

FA-5 Type Crystals, 0.01% accuracy: 1,500 Kc., £4/17/6; 7,000 Kc., £5/8/0  
14,000 Kc., £6/8/3; 21,000 Kc., £5/8/0

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but it takes time and patience and one wrong movement and the crystal may be cracked or the contact wires damaged.

For many filter applications the crystals should either be paired in frequency or raised or lowered for oscillator use. For those that smoke too much to have steady hands and fingers, or anyway feel reluctant to touch their crystals, I offer my help to adjust and match the crystals they may have. I could also at the same time set up a sort of crystal exchange bank. A dozen possessors of odd channels of crystals together may have enough to form useable pairs with little adjustments. But not to expect and swap odd frequency ones for the elusive 455 Kc. rocks. Also, after quickly distributing sets of four paired crystals to what I hope some 50 future s.s.b. operators, my stock of crystals is long exhausted and I am going to get a fresh supply somehow from overseas again at reasonable prices. When available it will be announced in "A.R."

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### FUNDAMENTAL FREQUENCIES OF FT241 CRYSTALS

Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency
0	370.370	20.0	16	400.000	21.6	32	429.630	23.2	48	459.259	24.8	64	488.889	26.4			
1	372.222	20.1	17	401.852	21.7	33	431.481	23.3	49	461.111	24.9	65	490.741	26.5			
2	374.074	20.2	18	403.704	21.8	34	433.333	23.4	50	462.983	25.0	66	492.593	26.6			
3	375.926	20.3	19	405.556	21.9	35	435.185	23.5	51	464.815	25.1	67	494.444	26.7			
4	377.778	20.4	20	407.037	22.0	36	437.037	23.6	52	466.667	25.2	68	496.286	26.8			
5	379.630	20.5	21	408.239	22.1	37	438.889	23.7	53	468.519	25.3	69	498.148	26.9			
6	381.481	20.6	22	410.111	22.2	38	440.741	23.8	54	470.370	25.4	70	500.000	27.0			
7	383.333	20.7	23	412.963	22.3	39	442.593	23.9	55	472.222	25.5	71	501.852	27.1			
8	385.185	20.8	24	414.815	22.4	40	444.444	24.0	56	474.074	25.6	72	503.704	27.2			
9	387.037	20.9	25	416.667	22.5	41	446.296	24.1	57	475.926	25.7	73	505.556	27.3			
10	388.889	21.0	26	418.519	22.6	42	448.148	24.2	58	477.778	25.8	74	507.407	27.4			
11	390.741	21.1	27	420.370	22.7	43	450.000	24.3	59	479.630	25.9	75	509.259	27.5			
12	392.593	21.2	28	422.222	22.8	44	451.852	24.4	60	481.481	26.0	76	511.111	27.6			
13	394.444	21.3	29	424.074	22.9	45	453.704	24.5	61	483.333	26.1	77	512.963	27.7			
14	396.296	21.4	30	425.926	23.0	46	455.556	24.6	62	485.185	26.2	78	514.815	27.8			
15	398.148	21.5	31	427.778	23.1	47	457.407	24.7	63	487.037	26.3	79	516.667	27.9			

Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency	Chan. nel No.	Fund. Fre- quency	Marked Fre- quency
270	375.000	27.0	294	408.333	29.4	318	441.666	31.8	342	475.000	34.2	366	508.333	36.6
271	376.388	27.1	295	409.722	29.5	319	443.055	31.9	343	476.388	34.3	367	509.722	36.7
272	377.777	27.2	296	411.111	29.6	320	444.444	32.0	344	477.777	34.4	368	511.111	36.8
273	379.166	27.3	297	412.500	29.7	321	445.833	32.1	345	479.166	34.5	369	512.500	36.9
274	380.555	27.4	298	413.888	29.8	322	447.222	32.2	346	480.555	34.6	370	513.888	37.0
275	381.944	27.5	299	415.277	29.9	323	448.611	32.3	347	481.944	34.7	371	515.277	37.1
276	383.333	27.6	300	416.666	30.0	324	450.000	32.4	348	483.333	34.8	372	516.666	37.2
277	384.722	27.7	301	418.055	30.1	325	451.388	32.5	349	484.722	34.9	373	518.055	37.3
278	386.111	27.8	302	419.444	30.2	326	452.777	32.6	350	486.111	35.0	374	519.444	37.4
279	387.500	27.9	303	420.833	30.3	327	454.166	32.7	351	487.500	35.1	375	520.833	37.5
280	388.888	28.0	304	422.222	30.4	328	455.555	32.8	352	488.888	35.2	376	522.222	37.6
281	390.277	28.1	305	423.611	30.5	329	456.944	32.9	353	490.277	35.3	377	523.611	37.7
282	391.666	28.2	306	425.000	30.6	330	458.333	33.0	354	491.666	35.4	378	525.000	37.8
283	393.055	28.3	307	426.388	30.7	331	459.722	33.1	355	493.055	35.5	379	526.388	37.9
284	394.444	28.4	308	427.777	30.8	332	461.111	33.2	356	494.444	35.6	380	527.777	38.0
285	395.833	28.5	309	429.166	30.9	333	462.500	33.3	357	495.833	35.7	381	529.166	38.1
286	397.222	28.6	310	430.555	31.0	334	463.888	33.4	358	497.222	35.8	382	530.555	38.2
287	398.611	28.7	311	431.944	31.1	335	465.277	33.5	359	498.611	35.9	383	531.944	38.3
288	400.000	28.8	312	433.333	31.2	336	466.666	33.6	360	500.000	36.0	384	533.333	38.4
289	401.388	28.9	313	434.722	31.3	337	468.055	33.7	361	501.388	36.1	385	534.722	38.5
290	402.777	29.0	314	436.111	31.4	338	469.444	33.8	362	502.777	36.2	386	536.111	38.6
291	404.166	29.1	315	437.500	31.5	339	470.833	33.9	363	504.166	36.3	387	537.500	38.7
292	405.555	29.2	316	438.888	31.6	340	472.222	34.0	364	505.555	36.4	388	538.888	38.8
293	406.944	29.3	317	440.277	31.7	341	473.611	34.1	365	506.944	36.5	389	540.277	38.9

# SIDEBAND TOPICS—BUD POUNSETT,\* VK2AQJ

How do you like the new presentation of this department? The general opinion on the air seems to be very much in favour. The success of Sideband Topics depends on YOU.

Do you have anything that is of interest to your fellow sidebanders? If so, please send it along to me and also note my new address. The information that I require is items about single sideband or an allied subject of a technical nature. What about, it OM, will you do your bit?

## 288 Mc. S.S.B.

Lance Harding (VK3AHL), of Melbourne, no longer has the distinction of being the world's only 288 Mc. s.s.b. operator. On December 9, Lance was joined by Jack VK3ZLC. On that

original circuit, and to warn you of the traps, here they are.

The 6CL6 driver tube does not have any bias on it. This is easily remedied by placing a 100 ohm resistor bypassed by a 0.01  $\mu$ F. disc ceramic capacitor between pin 1 and ground. The circuit diagram has pins 4 and 5 as heater connections for the 6146 and these should be pins 2 and 7. The tuned circuit between the transmitter mixer, a 12AT7 and the 6CL6, is a pi network and was replaced by a normal parallel tuned circuit with capacitive coupling. This was found to be easier to adjust.

The crystal in the original was for operation between 7.2 and 7.3 Mc., this being the American 40 metre phone band. For use in Australia the crystal frequency required is 5,700 Kc., which is readily available from disposal

The circuit in Fig. 2 was used to speed up the operation. With the vox relay open, there is no current flowing in the resistor R and the relay coil, so the voltage at the 100  $\mu$ F. capacitor is 12 volts. Closing the vox relay contacts discharges the capacitor through the antenna relay coil, pulling the relay in very rapidly. The resistor R now drops the voltage to the correct hold-in voltage for the antenna relay. The value of R can be determined by the application of ohm's law. Do not forget to also take the power dissipated in the resistor into account.

I do not know how fast in milliseconds this system is, but it is rapid enough to cause no noticeable clipping of the first syllable.

## OPERATING PROCEDURE

Just two comments this month, one on breaking-in and another about that "ah". Last month I mentioned a suggested form of joining a net. When you do break-in by giving your call sign at an appropriate moment, do so in much the same way as knocking on a door, then wait until you are invited in. When you are invited in, acknowledge all the members in the room—I should say, net—do not just address your remarks to one station and ignore the rest; this is ill-mannered.

Also when a station is calling CQ, try using break-in procedure as soon as you have his call sign. This saves lots of time and breath but does not seem to be in use today so much as it has in the past. You will be surprised how effective this can be used on a DX station. You may be able to beat all the rest who are lined up on the frequency waiting for him to finish his CQ.

How often have you run across the operator who cannot stand to have his vox drop out? This is the one who uses "ahs" and "ers" for commas, full stops and even several of either between paragraphs. How he ever manages to take a breath is beyond me. It is rather difficult to tell him of this exasperating habit—he will not mind if you tell him his signal is broad or distorted if it is, but his "ah, ah, ah" habit! Extreme tact would be required. However there is a way, although not available to everyone. If you have tape replay facilities, you might ask him if he would like to hear his own transmission. One usually listens rather critically to one's own voice, so he is sure to notice. Another method available to every one of us is to listen carefully to the way we speak ourselves. Next time you are having a contact, examine your own speech for these most unnecessary sounds.

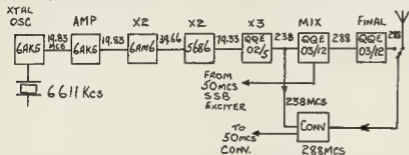


Fig. 1.—VK3ZLC 288 Mc. equipment.

Sunday, Lance and Jack made, we believe, the first two-way s.s.b. contact on the 288 Mc. band. These two pioneers have been working together on this project and naturally some of their equipment is identical. Their converters are the same as that outlined in "A.R."

The antennae used are 13 element long yagi beams. There is some difference in the transmitters. Both use 50 Mc. s.s.b. injection, but the VK3ZLC transmitter mixes in a 6QE03/12 balanced mixer driving a 6QE03/12 linear amplifier to about two to three watts peak output. Congratulations to two worthy gentlemen who are certainly doing their share in upholding one of the best of Amateur traditions.

## KWM-1 AND 40

There are a few KWM-1 transceivers in use around Australia and no doubt there will be a few more as time goes by, even though they are no longer in production. The one disadvantage of this very fine equipment is that 40 and 80 metres is not covered, only operation on 20, 15 and 10 being possible.

Recently (August 1962) "CQ" published an article on a converter, or to use the modern term, a transverter, to permit operation on 7 Mc. This takes the form of a receiver front end and an s.s.b. transmitter rear end. It does not require any modification to the M-1. To get to the point in mentioning this "CQ" article, John VK2BM found that an error or two has crept into the

sources, having been used in at least two different equipments, a walkie-talkie and a glide path receiver.

For those of you who wish to consult the original article, it is called "Adaptor for the KWM-1 to 40 Metres" by Tal Lawrence, 25GVZ and can be found in "CQ" magazine, August 1962, page 32.

## RELAY ACCELERATION

You may have the same problem that I had some months ago. I required my vox relay to operate a coaxial antenna relay having auxiliary contacts. The auxiliary contacts are used to control the transmitter and receiver so that antenna change-over and transmitter switch-on are sequenced by the relay. The problem was to shorten the time interval between the first sound into the microphone and the antenna relay operating. The vox relay, a 5,000 ohm squeel relay, from an SCR522 receiver, operates very quickly, but the 6 volt d.c. antenna relay was rather sluggish.

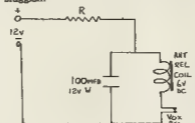


Fig. 2.—Faster Relay Operation.

## CHANGE OF ADDRESS

W.I.A. members are requested to promptly notify any change of address to their Divisional Secretary, not direct to "Amateur Radio."

\*1 Thorpe Ave., Queenbeyan, 48, N.R.W.

# For Accurate Matching & Maximum Efficiency Woden Multi-Match Modulation Transformers

MADE IN ENGLAND!



## Features—

- Potted type compound filled (vacuum impregnated).
- Universal application.
- Primary impedance range: 2,000 ohms to 18,000 ohms.
- Secondary impedance range: 200 ohms to 21,000 ohms.
- Highest efficiency—lowest weight per watt.
- Easy to solder heavily silver plated tags.
- Above or below chassis wiring.
- Capacity: 10 to 250 watts as under:

List No.	Audio Watts	RF Imp. Watts	Max. Sec. Current	Overall Size L. W. H.	Weight lb. oz.	Price incl. sales tax
UM0	10	20	60 mA.	2½" x 2½" x 4"		£5/16/0
UM1	30	60	120 mA.	3½" x 3½" x 3½"	5 8	£7/9/9
UM2	60	120	200 mA.	5½" x 4½" x 5½"	11 8	£10/13/6
UM3	120	240	250 mA.	5½" x 5½" x 5½"	14 8	£12/12/6
UM4	250	500	400 mA.	10½" x 6½" x 8½"	41 0	on application

Connections for Woden UM1, UM2, UM3, UM4 Modulation Transformers

PRIMARY CONNECTIONS FOR MODULATOR TUBES			SECONDARY CONNECTIONS AND IMPEDANCES FOR R.F. LOAD											
A to A	Radio Tubes	Impedance	1000 Ω	1500 Ω	2000 Ω	3000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω
1000 Ω	6X4	1000 Ω	1000 Ω	1500 Ω	2000 Ω	3000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω
1500 Ω	6X4	1500 Ω	1500 Ω	2000 Ω	3000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω
2000 Ω	6X4	2000 Ω	2000 Ω	3000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω
3000 Ω	6X4	3000 Ω	3000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω
4000 Ω	6X4	4000 Ω	4000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω
5000 Ω	6X4	5000 Ω	5000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω
6000 Ω	6X4	6000 Ω	6000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω
7000 Ω	6X4	7000 Ω	7000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω
8000 Ω	6X4	8000 Ω	8000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω
9000 Ω	6X4	9000 Ω	9000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω
10000 Ω	6X4	10000 Ω	10000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω
15000 Ω	6X4	15000 Ω	15000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω
20000 Ω	6X4	20000 Ω	20000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω
25000 Ω	6X4	25000 Ω	25000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω
30000 Ω	6X4	30000 Ω	30000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω
35000 Ω	6X4	35000 Ω	35000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω
40000 Ω	6X4	40000 Ω	40000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω
45000 Ω	6X4	45000 Ω	45000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω
50000 Ω	6X4	50000 Ω	50000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω
55000 Ω	6X4	55000 Ω	55000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω
60000 Ω	6X4	60000 Ω	60000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω
65000 Ω	6X4	65000 Ω	65000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω
70000 Ω	6X4	70000 Ω	70000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω
75000 Ω	6X4	75000 Ω	75000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω
80000 Ω	6X4	80000 Ω	80000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω
85000 Ω	6X4	85000 Ω	85000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω
90000 Ω	6X4	90000 Ω	90000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω
95000 Ω	6X4	95000 Ω	95000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω
100000 Ω	6X4	100000 Ω	100000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω
105000 Ω	6X4	105000 Ω	105000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω
110000 Ω	6X4	110000 Ω	110000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω
115000 Ω	6X4	115000 Ω	115000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω
120000 Ω	6X4	120000 Ω	120000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω
125000 Ω	6X4	125000 Ω	125000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω
130000 Ω	6X4	130000 Ω	130000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω
135000 Ω	6X4	135000 Ω	135000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω
140000 Ω	6X4	140000 Ω	140000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω
145000 Ω	6X4	145000 Ω	145000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω
150000 Ω	6X4	150000 Ω	150000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω
155000 Ω	6X4	155000 Ω	155000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω
160000 Ω	6X4	160000 Ω	160000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω
165000 Ω	6X4	165000 Ω	165000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω
170000 Ω	6X4	170000 Ω	170000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω
175000 Ω	6X4	175000 Ω	175000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω
180000 Ω	6X4	180000 Ω	180000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω
185000 Ω	6X4	185000 Ω	185000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω
190000 Ω	6X4	190000 Ω	190000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω
195000 Ω	6X4	195000 Ω	195000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω
200000 Ω	6X4	200000 Ω	200000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω
205000 Ω	6X4	205000 Ω	205000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω
210000 Ω	6X4	210000 Ω	210000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω
215000 Ω	6X4	215000 Ω	215000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω
220000 Ω	6X4	220000 Ω	220000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω
225000 Ω	6X4	225000 Ω	225000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω
230000 Ω	6X4	230000 Ω	230000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω
235000 Ω	6X4	235000 Ω	235000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω
240000 Ω	6X4	240000 Ω	240000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω
245000 Ω	6X4	245000 Ω	245000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω
250000 Ω	6X4	250000 Ω	250000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω
255000 Ω	6X4	255000 Ω	255000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω
260000 Ω	6X4	260000 Ω	260000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω
265000 Ω	6X4	265000 Ω	265000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω
270000 Ω	6X4	270000 Ω	270000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω
275000 Ω	6X4	275000 Ω	275000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω
280000 Ω	6X4	280000 Ω	280000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω
285000 Ω	6X4	285000 Ω	285000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω	340000 Ω
290000 Ω	6X4	290000 Ω	290000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω	340000 Ω	345000 Ω
295000 Ω	6X4	295000 Ω	295000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω	340000 Ω	345000 Ω	350000 Ω
300000 Ω	6X4	300000 Ω	300000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω	340000 Ω	345000 Ω	350000 Ω	355000 Ω
305000 Ω	6X4	305000 Ω	305000 Ω	310000 Ω	315000 Ω	320000 Ω	325000 Ω	330000 Ω	335000 Ω	340000 Ω	345000 Ω	350000 Ω	355000 Ω	3600



## VHF NOTES

(Continued from Page 15)

**59 Mc.:** A number of breakthroughs have been observed in VKS. All States with the exception of VKI have been worked consistently this season. Brian 8VV at Geraldton has been conducting regular suds with 30b 6BE over the pth./sth. path and has also worked this path on 144 Mc.

Kevin 6ZCB and his XYL Pam went on a DX-pedition to Esperance on the south coast and worked numerous stations in the east.

A number of the Group went to Rottnest Is., 13 miles off the coast, for a week over Xmas. They had both 30 and 144 Mc. 30x2 and among those with call signs were 6DL, 6ZBT, 6ZCP, 6ZDW and, I think, 6ZDX. They worked local stations on both bands and also quite a bit of DX. David 6DJ received c.w. a/s from Don 6HK by light beam. Don was using a 50w. spotlight modulated by the power switch. If nothing else, it proves Wembley and Rottnest are line of sight for v.h.f. transmissions.

**144 Mc.:** There are reports of more activity on this band. Viv 6ZCM has a 523 operating and has been using it for quite a bit of cross band operating. Neil 6ZDX has been testing a new tx he has almost completed, using a Kelco front-end and an 830 final. It has a built-in modulator. The filaments have been wired to operate off either 8 or 12 volts, so it should be a very versatile unit when completed and operating.

**288 Mc.:** After conducting test transmissions for some time, the tv. fraternity had a live night recently. The broadcastists landed cameras work, building a converter for Amateur t.v. reception, a 344 Mc. link enabled questions on the demonstration to be answered. Jack 8BU had a number of the v.h.f. Group interested in Amateur t.v. at his QTH to view the demonstration.

I would like to pass on the W.A. v.h.f. Group's best wishes for '63 to all our counterparts in other States. TX, 6ZDX.

### FAFUA

6 max produced some good DX openings during Dec. VKXs were worked on 2nd, and on 16th VKI, 3, and 4 were worked. 34th, VKM worked and 72A heard. VKIs again on 8th. A few weak VKIs and 34 heard on 28th. A rather weak opening occurred on 30th when numerous VKI, 3, 4, and 7 were heard, however only 6ZAZ was worked. A few very weak signals heard on 31st, whilst New Year's Day produced excellent DX, signals being heard and worked for over 18 hours. Call areas worked were VKI, 3, 4, 5, and 7. TE sentier signals on 49.9 Mc. were heard on the 17th.

As 6ZCV has been in Rebeul, no local 3 mx working took place during the month and tests with VKI produced no results.

T.v. reception was quite good with signals being seen from TKN, ABOG, AENI, ABEV, ABEI, and ABZL. 73, 8AU.

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## DX NOTES

(Continued from Page 17)

J.V. YOTDO, and many others. (Your previous letter missed Dec. early deadline, sorry, Al.)

Your VK3KX comes to light with a long list of really good ones, wk'd. in the last few weeks. 7 Mc. c.w. GADMY, KHKDD, ZLBD, HLBKX, VYBA, GJAK, YOKN, GSDQ, UT, IAA, OETI, OHNV, DUTSV, VRL, HKZQZ, FJZAE, YBIO, KXKX, HUSMO, SPAP, KP-100, DIZIN, IZL, DLIO, YUYQ, UAPF, DJ3VKC (IXYL), GSBZ, SKIAKW, OK3KX, CRAC, G3MOJ, SPBIO, etc. 14 Mc. c.w. HK3RG, KCAUXK, DJTJC, IYWC, SLSK, FEPO, ASIN, ULKID, UZTF, VYKXV, VP, ERG, VRMVB, SAITW, ZEEJ, VYSAE, XG-IAM, etc.

Your XYL, VK3KX, wk'd. on 7 Mc. c.w. VSIFF, DJ3VKC (YL op.), VEIIZ, DJTJC, and others. 14 Mc. c.w. ULTKDT, UDOKAK, UB-SCG, GSAAR, KCAAM, UQJFF, VYPMV, SAITW, SMLAE, PARLOU, ZLCT, DULIO, DLJGS. (Nice teamwork, let's have more notes, pe.)

Darrell L3041 heard some choices ones these past few weeks. They are 14 Mc. a.b. and between 800-1100 GMT. VRIAU, VGBIE, VS-ECL, KCAUSG, KRERN, KRCP, KGBAA, GEXS, GJAPF, FTA, SMERN, APSCD, OZIV, VREDS, YNIGM, KCAUXK, KRBH, PYCIB, DLBEM, BYCWB, HSBET, HLKXJ, etc. 14 Mc. a.m., LOTHJ, HVIUSA, ACAXA. (S.a.b. reports always needed, so v'y my nix!)

Ben Davay, VK3KX, R.A.A. Z. Townsville, reports conditions on 20 m. as good around midnight and late afternoon. He wk'd. on 14 Mc. EYIUS, KCAAD, DJTJC, DUTSV, GSWP, G3IIV, SMIJU, ULTKBK, KRMBD, OHZBZ, VQ4VR, OHJVO, V3RKH, VU3KV, ZB3RM, ZB3CI, Z35Y, KRGJ, KMBF, KXQCC/KC, etc., and heard a large number of really good ones. (Zka, Ben, it's always good to hear what's happening in the tropics.) Due to space limitation, it has been necessary to précis some of the above reports. Sorry (chaps).

### W.P.X.

Most overseas mags. feature a W.P.X. Honor Roll. Such a list creates interest and competition. So how's about submitting your W.P.X. score. It is tallied by adding the number of countries wk'd. to the number of areas contacted within those countries. Let's have a better response than last year's request. When sending in your notes or DX news, please include your W.P.X. score as well. Remember it is an Honor Roll and all claims must have QSL verification. Please indicate your section, i.e., c.w., a.m., s.a.b., or mixed.

### REMARKS

Radio Storm. During such a disturbance signals heard near or through the auroral zones fade out, sometimes entirely if the storm is severe. During this time it is best to concentrate on east-west paths in the daylight

hours and on north-south circuits during the morning and evening periods. Usually some band or circuit is workable.

Some of the VKs who helped this page along last year were SGL, SAMX, AQU, ZAXX, IZA, RAQ, SOY, SARX, SAHO, BRG, ZTL, ZAZD, SZHR, SAKN, SZMR, 4XQ, 4XJ, 4BL, BRX, BRX, SZC, SJF, BMY, BNO, BNQ, G3M, BRO, BERSIO, LSZC, L211, L3068, L401, L2021, L2041 and Rod de Balthaz. Let's hear from you all again, and others too, during '63. 72, Al, VK3AS.

P.S.—To facilitate matters, please mark envelope "Radio News".

## W.I.A. DX.C.C.

Listed below are the highest twelve members in each section. New members and those whose totals have been amended will also be shown.

PHONE			
Call No.	Cr. r/s	Call No.	Cr. Cnt.
VK3RU	2 270	VK3JWL	14 211
VK3AB	45 275	VK3ATN	20 204
VK3EMK	43 286	VK4HR	13 182
VK3AHO	32 290	VK4RW	23 184
VK4PJ	21 320	VK3GO	50 183
VK3KW	4 211	VK3WO	50 178
Amended:			
VK3BM	94 139	VK3JZ	61 190

C.W.			
Call No.	Cr. r/s	Call No.	Cr. Cnt.
VK3BK	10 305	VK3RP	50 229
VK3CK	36 288	VK3PH	15 225
VK3GL	5 279	VK3BZ	6 223
VK4PJ	39 270	VK3AGH	71 220
VK3NC	19 281	VK4HR	9 218
VK3RU	11 235	VK3KU	48 213
Amended:			
VK3RJ	43 195	VK3APK	78 174
VK3ARK	66 190	VK3AK	60 136
VK3NQ	73 183		

### OPEN

Call No.	Cr. r/s	Call No.	Cr. Cnt.
VK3ACX	6 260	VK3ARO	78 262
VK3RU	6 260	VK3RG	3 257
VK4PJ	22 278	VK4HR	7 232
VK3EMK	74 260	VK3BZ	4 231
VK3NC	77 265	VK3JA	43 229
VK3AGH	25 265	VK3W	42 225
Amended:			
VK3KW	13 321	VK3ACX	80 190
VK3NQ	81 200		
VK3APK	82 190		

## V.H.F. TWO-WAY RADIO FOR PRIVATE AIRCRAFT

Ferris Bros. Pty. Ltd. have announced the signing of a contract with Rex Aviation Pty. Ltd. to manufacture v.h.f. two-way radio equipment for installation in private aircraft, in particular the Cessna range which is distributed in Australia by Rex Aviation.

Developed by Rex Aviation engineers, the set has been approved by D.C.A. Ferris are confident that their experience in the manufacture of mobile-type electronic equipment will ensure that the product will meet all requirements.

The Rex Air Major consists of a transceiver and power supply unit, each separately mounted.

The transceiver comprises a 10-channel crystal controlled tx-rx operating in the 118-130 Mc. band. R.I. output power on full modulation of the transmitter is 4 watts.

The power supply is designed to operate and change over from either 14 or 28 volts d.c. without modification. Current drain at 14 volts is 3.3 amps. on receive and 4.5 amps. on transmit. A pair of switching transistors and silicon rectifiers provide efficient d.c. conversion. The audio output stage, which acts as a modulator during transmit, employs a pair of power transistors in push pull. It is incorporated in the power supply to keep the dimensions of the transceiver to a minimum and to limit the temperature.

Further details may be had by contacting Miss Hocking of Ferris Bros. Pty. Ltd.

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Sub Editor: J. M. (Mac) HILLIARD, WIA-L3074

57 Gardenia Street, Blackburn, Victoria

ADDRESS CORRESPONDENCE FOR THIS PAGE DIRECT TO THE SUB EDITOR

Hi there fellow S.W.I.'s, it has fallen my lot to present these notes to you. I would like to thank our retiring President and Sub-Editor Bob Young for the excellent job that he has done.

The starting off point for many of the Hams of today begins in the S.W.I. ranks, but why do so many of the Hams disregard the average S.W.I.? I admit that many of the Amateurs give much assistance to the newcomer. However there remains a large number who scorn at the S.W.I.

The practice of sending bad reports no doubt could be a contributing factor in conveying a poor impression of the S.W.I. in the minds of many Amateurs. But surely this is no reason to condemn the S.W.I. in general.

Recently a local well known Amateur here in Melbourne, who operates on s.s.b., was heard in one of the most glaring cases of ill manners that your scribe has ever heard on the Ham bands. The said Amateur was in contact with a W station, who was, by the way, 80, when another Melbourne station broke in this in itself was bad enough. But then the chap that had been working the W promptly started yarning with the local and just left the W out in the cold without making any further references to him. Surely this is one of the poorest cases of bad manners ever heard on the bands.

Remember chaps, this page depends on you and I am looking forward to hearing from all of you. All interstate correspondents will be answered and also locally where required.

#### VICTORIA

At our Xmas wind-up, we held a special meeting with the prime purpose of electing a new President, another Vice-President and a new Sub-Editor. The election resulted in Maurice Cox being elected to the chair with

Bob Young as Vice-President, and yours truly as Sub-Editor. Bob was forced to resign from the chair and also as Sub-Editor due to lack of time.

Much discussion took place as to how we can increase the membership of the Group. It was felt that if members had more to do in the Group that more interest would be forthcoming. Many of the younger members cannot afford to buy expensive receivers and it is to these younger members that we must encourage. At the conclusion of the meeting we all had a few cold and soft 80's.

The big event of the year will soon be coming off and of course that will be our Convention at Ballarat, which takes place over the first week-end in March.

Our President, Maurice, has been flat out in the Ross Hull Contest. However, he will not have things his own way as Ian Thomas and Bob Young have not been idle during the Contest. David L3125 has just erected a long wire which is 130 feet long and it is pulling in the signals in fine style. His hearing aid is a dual wave receiver. Very pleased to hear from you David and will be looking forward to receiving further news from you.

#### QUEENSLAND

Only news to hand from VK4 this month comes from our good friend Afton Westcott up at Alherton. Afton has been on the sick list for several months. We are all sorry to learn of your trouble Afton, and wish you a speedy recovery and hope you will soon be back amongst the DX. How about some of you other VK4 boys dropping us a few notes of your activities now and again?

#### NEW SOUTH WALES

Our old Buddy Chas. Abernethy is going well in the Ross Hull Contest, and my spies

tell me he has over 1,300 points. Best of luck to you Chas.

I would like to remind you all that I must have all correspondence for this page no later than the last day of each month.

What has become of you fellows in VK6? Apart from Peter Drew, we would not think that VK6 existed as far as S.W.I'ing was concerned. So what about it, you chaps?

Remember this is your page and it is up to you to provide us with news of your activities. But unless you do this, we can hardly be expected to provide news out of the air.

Well that is all for this month, so 72, Mac Hilliard.

	DX LADDER				S.s.b.	W
	Countries	Conf.	Hrd.	Conf.		
E. Trebilcock	277	322	40	—	—	26
D. Granley	111	250	38	16	85	34
A. Wescott	84	158	31	9	107	11
M. Hilliard	70	214	33	12	128	11
M. Cox	61	280	29	27	135	16
C. Abernethy	44	85	27	—	—	14
N. Harrison	38	92	27	—	—	29
P. Drew	33	180	19	7	63	11
I. Thomas	29	124	18	6	68	11
P. Fields	20	128	—	—	—	—
D. Jenkins	10	144	7	—	—	—
H. Burger	8	135	5	1	19	—

#### NAT. FIELD DAY CONTEST

9th and 10th February, 1963



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# FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

## FEDERAL AWARDS

During the past year W.A.V.E.C.A. awards Nos. 145 to 152 have been issued as follows:-

WEDQH	GEORGE	VERBOP	JAAIA
WINUT	GDGCG	UARG	
QVMD	QVMD	UASAY	WIBIT
UCUAA	DELYA	KPMWD	YAFZ
QIFPO	ZILIARY	WVBQV	ZLIVJ
KEICV	ALBOS	UASAY	
QSGM	WIEGO	VSEBC	YUJAJ
PMMS	APMPC	WELKOK	WREZL
KUCYF	WIUOP	JAJAJU	

Australian D.X.C.C. Countries List in "A.R." January 1963: Amend "Pakistan" to read "East Pakistan" on fifth line.

A. Kismick, VK3KEB, Manager.

## NEW SOUTH WALES

The Xmas meeting of the N.S.W. Division was held at the Wireless Institute Centre on Friday, 14th Dec., and the attendance was so good it was a battle to find enough seating accommodation. Essential business was disposed of as soon as possible and the meeting handed over to Alf BSW who operated the projector and showed the "Space Ace"—a documentary film of the recent orbital space flight of Major John Glenn. The film was a most interesting picture taken from the capsule in orbit.

The President (Max IMPI) moved a vote of thanks to Alf for his capable handling of the project but more especially for the fact that Alf has donated the whole 18 mm. projector and sound equipment to the Institute. Alf also showed a film of the visit of Merry Xmas and closed the meeting for refreshments served from the kitchen under the supervision of Geoff BACQ.

Another Xmas Party was held by the Griffiths Radio Club on Sat. 8th Dec. at the residence of the President (Fredie BBU). Visitors were present from Hillston, Tabbatta, Leeton and Narrandera. Blind fold tv hunts, dancing to bagpipes and a barbeque were held. There was a buffet table well stocked. Musical items were supplied by Mrs. Stojack (2YL, of 2ACB), Doug and Paula (harmonica), Fredie BBU, and Max and Max friends attended the function.

The last Council meeting for 1963 was held on 20th Dec and the Council appointed Fredie BBU as organizer of the forthcoming Federal Convention to be held at the Wireless Institute Centre over the Easter holidays. There has been a big job in organizing such things as the Fed. Dinner, accommodation for delegates, transport to get the delegates to and from the meetings, meals, reporting facilities etc., and he would be pleased to hear from anyone who can assist him, ring Fredie at YD 6138. The Education Officer, Harold 2AAH, had a spare night over the weekend and has now taped up another tape entitled "A Survey of V.H.F. Aerials" by 2AAH. This tape runs for 48 minutes and is illustrated with 32 slides. For particulars, contact Harold.

It has been the custom from time immemorial to set aside the February meeting for the "Fest of the Future" and we are looking forward to a good lecture by the V.H.F. and T.V. Group, 73, SYL.

### HUNTER BRANCH

The Christmas meeting of the Branch was held on 14th Dec. and, after the shortest business session on record, the 22 members, associates and visitors present settled down to an interesting evening of colour slides presented by Bill 2XT. These featured his recent visit to War East and were liberally interspersed with pictures of particular Amateur interest. At the conclusion of the show two very interesting films, a treat for the eye and ear, were projected and used. Both created quite a deal of discussion centring mainly on presents for the festive season. The night concluded with the usual barbeque and wishes to all.

During the holiday season activities have been much as usual but the Branch has been taking particular care to get the 60 Mc. gear in trim for the excellent openings which have been appearing on that band. It is even re-

ported that Mac 2ZMO wishes to have a telegram sent if anyone wants to contact him on 144 as he is so busy on 81. Others on the 80 Mc. bandwagon are Ian 2ZIF, Des 2ZDN, and Stuart 2AYT, to mention but a few. Bill in the V.H.F. operating on 144 has reported that there has been an upsurge of 144 preparers in the early city. Peter 2AJY has a brand new high powered rig and when he goes and when he is very high power, I mean just that. He burned out a 0-5 amp. r.f. meter in the dummy load while testing the gear! As for the ether in the 2.75 vicinity, things are moving, but slowly. Chris is waiting for his aerial pole to grow a little taller so that he will get the wire a half wave high. Ian 2AYT has browned out the 1.7 troubles and now has a modulator working. It is a very efficient 90 watt, there has been an output at the present of 4.5 watts—out.

Two more members have been notified of their success in the limited experiment. They are Bill Sinclair and Len Deady. Bill tells me he is ready to go on the air as soon as the licence arrives. Len is building but how close to being on the air is not known.

Out by the lake side is one very proud Amateur Jim 2AHT has been notified of his winning of the "CQ" world wide DX Contest. The contest was a very close one and Jim was the shack wail. In addition, he has all the cards ready for D.X.C.C. which is really fast work considering. Jim is now in the active during the present spell of operation. Another consistent signal is the plea from Bill 2EL, for someone to lend him a mobile crane. Bill is having some trouble getting labour to install the new piers for the railway and is thinking of borrowing a few sky books and some other things.

Nell 2ZCV hopes to be out of hospital and back on the job again soon and it is hoped that by the time she is back she will be able to help out. Another member on the sick list is Ern 2FP. All the best for a speedy recovery and return to the old firm where, by the way, the 2.75 and 2.75 are still working. Lionel 3CB returned. It is said the water supplies are now in very good hands.

Rodney 3CN has a new 16 or 18 long ton motor for his motor launch. He is now on 201. Ron 2ASJ, now a regular 2 mhz man. Another seldom heard signal on 2 is Ron 2AAI, while Ted 2ZV is having some trouble with his rig. He finds this has something to do with the anchorage point for the beam. Varley 2SF is now on one band at a time, which is more than can say about the signal from this QTH, so progress is being made. Lee 2HJ apparently has had a great deal of success with mobile operation in V.F.S. so ask him about it at the next meeting.

Gordon 2ZSO is busy with audio trouble, he still means to get his rig out but I haven't heard Tony 2ZLT of late and a report says he has changed employment. Bill 2XT has been out of the country for a while and is still busy disposing as is Bob 2AQR although it's quiet at home now since number 3 on left for Narrabri. Norm 2ZNF still trying to get some signal out of the AMRSON and here's something—John 2ZS is re-building the rig so you can see that 1963 has begun well all round.

We'd all like to see you at the next meeting which will be held at the Newcastle University College on Friday, 8th Feb. We will be there along. The lecture room is very large and we'll keep a chair for you. 73, 2AEL.

## VICTORIA

Possibly one should start by apologizing for lack of notes the last two months. Luckily they do not seem to have been lost and the State Convention, and as I was not at the Nov. Council meeting that leaves me in the dark for the last two months. The last meeting was too late for Jan. notes, and at this late stage I'm rather hazy about what took place. The notes I made have been mislaid. But the details of the Council meeting and discussing the proposed additional facilities at the rooms. Firstly, the library section is to be re-housed. The fact that the new building is to be installed and in use by now. The test bench project appears to have come to a stop, due to the resignation of the moving firm.

behind it. This matter will probably be fixed early in the new year. The Moon Beacon project is a dark secret (at least to me). Can anybody produce any info.

Council will next meet at the end of Jan. but as I will not be there, perhaps our Publicity Officer will send some notes to "A.R." What about it Harold?

The Institute suffered a blow in the death of Bill 2TK early in December. Bill held a licence since way back about 1913. For the last five or six years he had been closely associated with the Publications Committee as circulation manager. 3RN, 2ATJ, 3CM and 2ACM were among those who attended the funeral.

Now that these notes are being typed, I don't feel so kindly towards the printer. As they can now be read, Parsons will have to have his space reduced in my favour. After all, I am a friend of the whole committee, etc., etc., ad nauseum. To show him there are hard feelings, I'll publicly thank him for his Xmas Greetings and at the same time wish him all the best for 1963. I'll even go further and tell him there are strong indications that his old "Arab Enemy" will be heading for the City of Pubs during February, and when last seen was checking his array of lethal weapons.

The friendly net 114.88 Mc. is growing with the release of further carbones, and is now spreading into the country areas. They now form a solid core to W.I.C.E.N. Fortunately their services have not been required for any major emergency this summer, but there is still a couple of hot months to go. Plans are in hand for similar nets on other frequencies. The net was ready for action one night in mid Dec. when a boy was missing in the Dandenongs. Several members were in the area assisting and the boy was found before full scale operations were needed.

Heard by the grapevine that communications by the people patrolling the Nullarbor during the Empire Games were not all that could be desired. Has anyone any first hand info? Could make an interesting article for the mag.

Sam 2ALX recently and sorry to say, he has been far from well. Maybe too much effort for his age. He has been on the sick list, who has been on the sick list, but has since been heard operating mobile marines in contact with the heir to the family fortune, 2AAJ, who was operating mobile. Talking of sick lists, what is wrong with the Ballarat air.

## CENTRAL COAST FIELD DAY

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144 Mhz. tv hunt, 60 mhz tv hunt, all band scramble, general entertainment. Applications for all types of exhibitors on application to Mr. J. Walters, C/o Ocean View Hotel, Urunga.

Most of us, at some time or other, have been approached to "Just have a look at my television and tell me what's wrong with it." Well, I've been told this experience isn't all that pleasant. But I'm a shy but helpful type (Pansy won't think so...Ed.), reluctantly toddled off to have a look at the monster. Now if ever you've climbed out of bed in the middle of the night and find a female form draped in a rather skimpy bikini standing by watching, you'll know what I mean. Possibly somebody years older than myself like SP5 could handle the situation, but I'm afraid I couldn't. I was a little tubs. Can anyone tell me if this study of a heavenly body while driving into a i.v. rack makes me a radio astronomer? Ouch.

### MIDLAND ZONE

I have no apologies to offer for the non-appearance of the Zone notes in the Jan issue. I was away from home 1/17-18/69. What happened Ed? [As notified in Nov. "A.R." the Jan. notes closed on last Dec.—Ed.] Activities on Zone hook-ups are reasonably fast-paced at the moment. The increase there have been some DX break-throughs on 8 mhz of which our President (Don Carr) has taken credit. There's also the increase in activity as well as operating on the 3 mhz band. I am afraid I am not very well informed on the activities of Zone members generally, but due to my own activities.

My own activities have been confined to operating on 40 mhz DX and some local 40 mhz work. I have been able to make good progress operating from Kyneshon with a Q4 S4 signal in Castlemeine. Please note, your copy of the minutes of our last meeting held at Kyneshon will be found tied together with your next meeting notice in order to reduce postal costs. Our funds just won't stand two despatches. TS, AND

### EASTERN ZONE

Ken (ex 3ZNB) and Ross (ex 3ZAQ) now have their full call signs. 501 (Moe) and 3NS (Warrigull), both stations operating initially on 40 mhz. 3AMS at Foster and Martin. 3AMV at Warrigull hope to come on in the next few weeks. Jack 1AJK is still winning more countries on 14 Mc. phone, he now has over 20 countries marked up. The v.h.f. boys have been working their fair share of DX.

The Eastern Zone members are quite keen in setting up an emergency network throughout the Zone. The v.h.f. boys are buying f.m. carphones, two are already installed. Stations willing to operate on 2330 kc. please contact David 3DY.

Our Xmas party at Alf's went off extra-again. Best wishes and DX to all Zone members for 1963. 73, 3ZCG.

INTERVIEW WITH

SAZ, Hugh McLachlan, better known as Mac, is now residing in Horebush. A s.b.h. name, he has been in the States for some time. Mac, Vic SAQO, a regular on the weekly Zom hook-up, is now approaching the busy time of the year, as may be absent on most Wed. nights. He is living in the States, and was formerly of Shepparton, is now living in Ararat. Welcome to the Western Zone Nev., see you p.m. Wed. on 3630 kc. Chas ZIF is now in the States, and is working DX on the h.f. bands due to heavy QRN of the masted-made type. Seems as summer approaches the propagation is improving. The E.C. is full of trouble due to the h.v. S.E.C. power mains. Perhaps a decent shower of rain will cure things Chas. Bill SAUK is about to have the E.C. power mains replaced. Hope Chas' troubles don't frighten you, Bill.

This is the first rotation of Zone notes correspondents on a roster system as decided at our last Convention, so in fairness to the next in line, let's see a zone-wide roll up at all future book-ups. **72. SAFO.**

## QUEENSLAND

Well the wheel has spun around again and picked me up for the second time. I thought we had struck when Don Marshall took over our "A.R." sub editorship and news service, and so we had, but Don is busy building a bower for his bride to be and won't be with us for a while. Thanks for your help Don and all the best to you and your YL. Who is going to do the job now? I'm not a SPR that can take several jobs at once. Get off your \_\_\_\_\_ some of you chaps and have a go. What about a country member for a

Talking about country members. At times of writing Claude GUX came down through the train to spend a week or two in Brisbane. He was talking about the possibility of him and Basil going on a ring one night but I didn't meet our Mt Isa mobster JGC; next day he called me at home and said that the members make themselves known even though it might only be over the phone. That's not bad is it? I guess most of our country contacts are still active. The last time I saw a news line has been received here. See that some comes by the end of the month fellows.

The Council nomination form in "QTC" - If the person nominated can forward or have forwarded a few words about himself it will be more likely to get elected. It doesn't cost e.g. number of years a licensed W.I.A. member, occupies previously held in the W.I.A. if any, occupation, age etc. But it does require the person to provide this information.

Has anyone given thought to what should be done if sufficient nominations to form a Council are not received? Should the Federal body take over? Give a few more thought/s to the formation of Council and do something about it.

By now you should have Pat's (4KB) notes on the constitution and realise it is quite a problem, taking up real time, to find a good solution.

Glad to see Jan. "A.R." with a couple of articles of VK4 origin printed. Should be more of it. (Always pleased to receive articles. Ed.)

I wonder if we will have passed our membership of 400 by the time this goes to press? Don't say it can't be done—a lot of people thought it a great joke that we thought of winning the R.D. Contest, but we ran pretty close. Oh for those 12 or 14 logs—how valuable they would have been. Where's my handkerchief.

Have you forwarded your Jamboree-of-the-Air report? Better late than never. A very nice card and letter of thanks to hand from Kallangur Group.

Ron Reed, ex 2DR, ex 4DU, now 6DR, is now radio officer at Christmas Island in the Indian Ocean. Don, who will be coming back to Amateur Radio after 23 years, was once Secretary of the VKE Division when Bill Moore, Jim Corbin, Morris Myers, Peter Adams and others were on the committee at that time. Don has a 200 ft. tower and a 150w. tx ready to go.

In the meantime have you any radio courses, text books, old copies of "CQ," "QST," "A.R." sent for a radio club technical library that Don is assembling in conjunction with a radio club he is forming on the island? Contact Becc 3333J, G.P.O., Brisbane, and we will give forwarding instructions.

On 30th Nov. one of our most interesting visits was made to the Brisbane City Council's Sound Engineering Laboratory at Mayne Junction. There were most of the interesting exhibits, and the most useful of the instruments. Most of the measurements were made on Qld. air calibrated. Most of the equipment measured volts or amps to two many decimal places for the average Amateur, but the various demonstrations, including the use of the "Goniometer" and the "Spectrum Analyzer", etc., were all very worth while. Thanks to the G.O. Engineer, Mr. J. H. Smith, of the B.C.C. for the excellent supper provided.

Well I've been stricken with the B.C.C.-S.E.A. merger and laryngitis apart from personal problems, but I would like to be portable for the National Field Day. I'll be trying. Will you let us see a few more VLF comes this year.

Sam 4CZ is getting about again and by now I hope is back to normal health. Sam is now with the S.E.A. Bill Jehn, our s.w.I. registrar, had such a good time in Adelaide he didn't even have time to look up EPS.

Thanks for giving Aft 40L a call when he's running the 4Wt session on Sunday morning. Rick 4VR usually carries on after the news on 20 mx band and would welcome a call. What about it northeastern? If you can't stay home for the main hook-up on 40 mx, just dial in your car signal when you can. You'll like to know you are about. You can always get Aft around 1145 before 0900 hrs. and pass on any items of interest—he will appreciate same.

## TOWNVILLE AND DISTRICT

As these notes will be the first for the New Year may I take the opportunity of wishing each and everyone a Happy New Year and the precious hope that you all have better luck in landing that rare DK. At the present moment I am listening to the boys on the Kookaburra and I am sure that if you are on the same wave, it is not too good as they are experiencing difficulty in hearing each other. While on this subject, the old cry what has happened to the boys on 14 Mc. on Sunday morning at the close of the W.I.A. hook-up. At times 4VR is heard and seems I cannot always break them.

No advice from my spy on the Lower Mercurian as to what is happening down there. But as a result of having to pad the notes locally not much doing on the air but recently happened to hear John QED, and other names Charlie on 7 Mc, it is pretty dull lately. Bert ALB don't rate a mention as we can almost hear each other if the windows are open. The family has moved from Harrisburg with the family en route to the southern States for nine weeks sightseeing and reports that the Z boys in Cairns are making hay and the Y's are still working hard at their work and playing around the town on 1040 Mc while BJL EBE has worked into VKG again and quite a number of QSOs over the bow-down south. T. 4RW

## SOUTH AUSTRALIA

The monthly general meeting of the VKS Division for Dec was held in the clubrooms to a capacity gathering of members, together with an increased number of the female sex. The night took the form of a Xmas get-together and was the usual great success, judging by the reactions of all present, and must have pleased all those behind-the-scenes.



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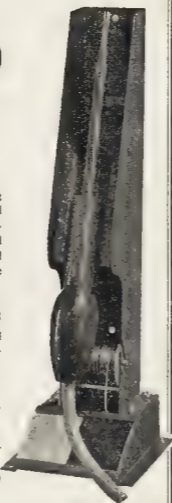
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Heard Rex SKY and Reg EBR having an old-time QSO on 1 Mc. during New Year's Day. After an old fashioned QSO I made a QSO in which both sides are as natural to listen to as if they were in the same room, and with a complete absence of unnecessary technicalities. They were on for some time and discussed a variety of subjects from New Year resolutions to proposed alterations and painting. Very easy on the ears, fellows, it wouldn't get either of you a Nobel Prize for scientific discussion, but it sure was Amateur radio at its best.

One of my female spies, a seductive bit of the doings, informs me that Jim SKJ is disappearing from a new car. So far I have not caught up with him, but someone whizzed past our QTH last night with a loud toot-toot, and if that was not our debonair Aristocrat then I'm wearing glasses.

By the way, my little paragraph regarding Jim SKJ being a clarinet player of note, found out the fact that Rex SKY used to be a member of the combination, playing the saxophone and doubling at times on the squeeze-box. I might have my instruments mixed up a little, but at least two of our members have been hiding their light under a bushel.

Received a very unexpected telephone call from the Dept of Civil Aviation. I was very and quite surprised to hear a charming young lady ask me from the other end of the line, "Did I represent the radio magazine 'Amateur Radio' in Adelaide?" Fearful of legal actions, unpaid debts, or possibly recantations from the Victorian Duxton's Union as the player himself then I wrote a letter. I can't say, "Well, I have some slight dealings with them. What can I do for you?" Well, to make a short story longer, and thus upset the new year of '54, it appears that D.C.A. have heard of some conversation regarding the conversion of AR's contained in some back issues of "A.R." and although they had contacted all booksellers, newsgaters, libraries, etc., etc., for back copies, they had no luck. Well, to make a short story even longer, how I did it, I'll leave them all of the back copies they required, to the mutual satisfaction of all concerned. So there you have it. Joking, of course, but the Publications Committee might consider it worthwhile to send a copy of the mag. to each Australian library, all other technical publications do. Just think of it, my monthly mutilation of the English language, as she is writing, might yet grace the shelves of all Australian libraries.

Having made a 1953 resolution not to write too much copy for the magazine, ho-hum, and a couple of hum-hum, must not pass. However, many thanks for all the cards and letters, coarse and refined, received from everybody, and I can only say with traditional modesty—get much out of it, but I'm not writing notes as apparently the readers do. My cup of happiness is brim-full at the moment, because nobody in VK3 could send any Pansy Xmas Cards to send in retaliation. Between you and I, fellows, my stocks are getting very low over here. Can anybody help? T3, de SP5—Pansy to you.

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## WESTERN AUSTRALIA

Following my predictions recently in regard to what became known as 'Games' I can only say "I told you so!" The moment of crisis occurred at about 4 p.m. on Dec. 1 and the parties were over by 8 p.m. In fact by the time Sunday morning came there was practically no signs of the fever left, and the parties had died down. Very few of the 50,000 people, who had been so violently affected the day before, found they had nothing to do except be a little sad that the whole thing was now over and they must now commence the long hard battle to win back the world, not to mention various parts of Australia.

The biggest thing that I am sorry about is the fact that my friend, Ted, who was on 9 m. Sat. 1st Dec., till 11.30 p.m. that night. This apparently was too much for it and at the time of writing still hasn't been heard. Anybody know a good tv. technician in this area? Alternatively, anybody want to buy the 18 pieces I have spread over the lounge room floor! What's that? No! You can't have that piece there. That's the neighbour's daughter. She only came in to watch the Games!

Presumably, my spies are still doing a recovery bit from the Games, for I have had no reports for some time now. At least I presume that is what has happened.

Lance ELR is having trouble with a plate. The information has been passed to the right quarters, but all I stand are warned, so if you can contact a bloke giving the 6 m. you know it isn't Lance, see if you can pin-point the signal.

Heard an interesting tape recording recently. Bill EBR, a new Ham, has made some of the 6 m. break-throughs recently. VK3, 4, 5 on the ether and even 9AU. Fine bit, chaps. Keep the good work going.

Still on 6, believe that Brian SVV at Geraldton has been in contact with Bob EBR every a.m. lately, although sometimes has been down c.w. copy, contact has still been maintained. Brian to lend them the 6 m. Don EBR, from 2 to 6 m. What about a note about the activities either or both Brian and Don?

Another Brian EZDE has been doing some heavy iron work on a choke recently. The core is about 4 x cubic foot and Brian hopes to convert this to a choke which by the use of silicon rectifiers, will give a 1/2 amp at 2, 3, 5 or 12 hundred volts. What! All that meat and no potatoes! How about an article on this? Brian EZDE has finished. Brian's cohort, Bob EZDF says he hasn't been doing anything, but I suspect he's just not as keen as you and I.

Dennis SA6 says he hasn't got an antenna for the d.c. band, 160, 80, 40, 20, 15 or 10, but he is going to have a beauty on 8 and an even better one on 2. With a 12 element, 6 over 6 waving about on his extended tower. So watch out for the big signal.

Great excitement at the QTH of Alvin EZDM recently. Alvin's XYL presented him with a lady Junior on 10. As you would expect you'd have thought he'd done the whole job himself. All the best to both XYL and babe, Alvin, and try and keep your young lady's people can produce daughters too, you know.

By the way, there is a job coming up in the new year for somebody. You may have heard of the effort made in the other States to organise the young people who are showing an interest in Ham Radio. Well, the same sort of thing is badly needed in this State. So give it some thought, and if you are in preserving the craft, if nothing else. Hop in with your offer to help the youth of our State.

Talking about new jobs, reminds me, Council is hoping to improve the Bulletin presentation in 1954. So your literary types are required for the magazine committee.

As it is 1953 by the time you read this, may I extend the compliments of the season to you from all members of Council and all other members of the Division. T3, EL5.

## TASMANIA

The holiday season has produced a very good crop of mobile and fixed portable stations. Noted Ted T3 and at Burnie, Snowy MCH around the southern coast. Lee TKC with his recently installed car equipment, motoring soberly around Hobart. Bob EZDF (727 of EBR) mobiliising nimbly around the Island, Bill TVY from his country residence, "Checkers", Davey; myself, unrigged, paid a call on VK3.

We are sorry that our friend, Jim WJO, has been fit to uproot his antenna and re-plant it at Launceston, and we confidently expect to hear Launceston on the air much more than hitherto.

Den JDK and his XYL Verna (the 'Den Kicker') have bought a house in Launceston. We believe they moved on 15th Jan. This should ensure that the Launceston air is now very frequent.

We in Hobart were delighted to see again Brian EZBE back from passing his training course in VK3, in preparation for a year of cold feet and ice-bergs on his nose when he is deported to Davis Base in Antarctica where he will be operating under the call sign VK-BBE. (Any similarity to civil dignities bestowed on a Royal occasion is purely coincidental, Brian assures us.)

Charlie TK5 and Max TMX were both mobilising on the mainland during Dec., playing fox hunts on a large scale, to judge from the way they chased each other about.

Andy SVV was a visitor to our shores over Christmas and his 15w was heard pumping out a good signal, T3, YZ2.

## HAMADS

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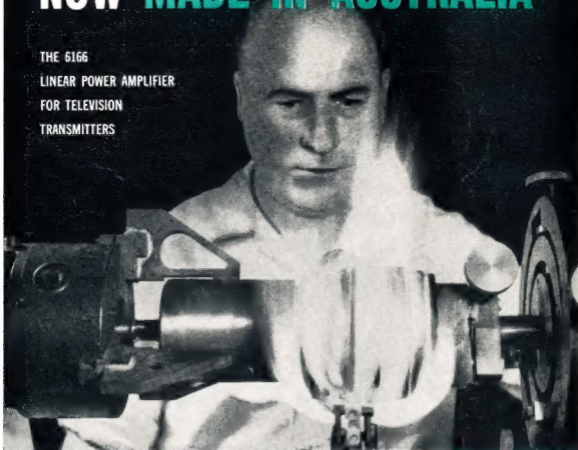
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